

Article 34

CLAIMS

1. A method for shading a three dimensional textured computer graphic image comprising the steps of:  
providing data defining the three dimensional computer graphic image;

providing a set of surface normal vectors corresponding to the texture data for the image wherein the surface normal vectors are stored in a local coordinate system;

providing data defining at least one light source and its direction illuminating the image wherein the light source is defined in the same local coordinate system; and,

for each pixel in the image, deriving a shading value to be applied to that pixel from the set of surface normal vectors and the light source data.

2. A method according to claim 1 in which the surface normal vectors are stored in polar coordinates.

3. A method according to claim 1 or 2 in which the light source data is stored in polar coordinates.

4. A method according to claim 1 in which the step of deriving a shading value to be applied to a pixel comprises deriving a colour value and a blending value from the light source data and combining this colour value with existing colour data from that pixel in dependence on the blending value.

5. A method according to claim 1 in which the surface normal vector is stored in Cartesian coordinates.

6. A method according to claim 1 or 5 in which the light source data is stored in Cartesian coordinates.

7. A method according to claim 5 in which for each surface normal only two of the Cartesian coordinates are stored.

8. A method according to any preceding claim comprising the step of applying a linear filter to the texture data at least once to map values to individual pixels.

9. A method according to any preceding claim including the step of applying a glossiness parameter to a pixel.

10. Apparatus for shading a three dimensional textured computer graphic image comprising:

means for providing data defining the three dimensional computer graphic image;

means for providing a set of surface normal vectors corresponding to the texture data applied to the image wherein the surface normal vectors are stored in a local coordinate system;

means for providing data defining at least one light source and its direction illuminating the image wherein the direction of the light source is provided in the same local coordinate system; and

means for deriving a shading value to be applied to each pixel in the image from the set of surface normal vectors and the light source data.

11. Apparatus according to claim 10 in which the surface normals are stored in polar coordinates.

12. Apparatus according to claim 10 or 11 in which light source data is stored in polar coordinates.

13. Apparatus according to claim 10 in which the surface normals are stored in Cartesian coordinates.

14. Apparatus according to claim 10 or 13 in which the light source data is stored in Cartesian coordinates.

15. Apparatus according to claim 13 in which for each surface normal only two of the Cartesian coordinates are stored.

16. Apparatus according to any of claims 10 to 15 comprising means

for applying a linear filter at least once to the texture data to map values onto individual pixels.

17. A method according to claim 10 in which means for deriving a shading value to be applied to a pixel comprises means for deriving a colour value and a blending value from the light source data and means for combining the colour value with an existing colour value in dependence on the blending value.

add  
B1